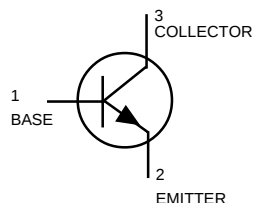


High Voltage Transistors

NPN Silicon



MMBTA42LT1
MMBTA43LT1



CASE 318-08, STYLE 6
SOT-23 (TO-236AB)

MAXIMUM RATINGS

Rating	Symbol	Value		Unit
		MMBTA42	MMBTA43	
Collector-Emitter Voltage	V_{CEO}	300	200	Vdc
Collector-Base Voltage	V_{CBO}	300	200	Vdc
Emitter-Base Voltage	V_{EBO}	6.0	6.0	Vdc
Collector Current — Continuous	I_C	500		mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board, (1) $T_A = 25^\circ\text{C}$	P_D	225	mW
Derate above 25°C		1.8	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	$^\circ\text{C/W}$
Total Device Dissipation Alumina Substrate, (2) $T_A = 25^\circ\text{C}$	P_D	300	mW
Derate above 25°C		2.4	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	$^\circ\text{C/W}$
Junction and Storage Temperature	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

DEVICE MARKING

MMBTA42LT1 = 1D; MMBTA43LT1 = M1E

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage(3) ($I_C = 1.0 \text{ mAdc}, I_B = 0$)	$V_{(BR)CEO}$			Vdc
MMBTA42		300	—	
MMBTA43		200	—	
Emitter-Base Breakdown Voltage ($I_C = 100 \mu\text{Adc}, I_E = 0$)	$V_{(BR)CBO}$			Vdc
MMBTA42		300	—	
MMBTA43		200	—	
Emitter-Base Breakdown Voltage ($I_E = 100 \mu\text{Adc}, I_C = 0$)	$V_{(BR)EBO}$	6.0	—	Vdc
Collector Cutoff Current ($V_{CB} = 200 \text{ Vdc}, I_E = 0$)	I_{CBO}		0.1	μAdc
MMBTA42		—	0.1	
($V_{CB} = 160 \text{ Vdc}, I_E = 0$)			0.1	
MMBTA43			0.1	
Emitter Cutoff Current ($V_{EB} = 6.0 \text{ Vdc}, I_C = 0$)	I_{EBO}		0.1	μAdc
MMBTA42		—	0.1	
($V_{EB} = 4.0 \text{ Vdc}, I_C = 0$)			0.1	
MMBTA43		—	0.1	

- FR-5 = $1.0 \times 0.75 \times 0.062$ in.
- Alumina = $0.4 \times 0.3 \times 0.024$ in. 99.5% alumina.
- Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

MMBTA42LT1 MMBTA43LT1
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Max	Unit
ON CHARACTERISTICS (3)				
DC Current Gain (I _C = 1.0 mA, V _{CE} = 10 Vdc)	h _{FE}	25	—	—
(I _C = 10 mA, V _{CE} = 10 Vdc)		40	—	—
		40	—	—
(I _C = 30 mA, V _{CE} = 10 Vdc)		40	—	—
Collector–Emitter Saturation Voltage (I _C = 20 mA, I _B = 2.0 mA)	V _{CE(sat)}	—	0.5	Vdc
		—	0.5	
Base–Emitter Saturation Voltage (I _C = 20 mA, I _B = 2.0 mA)	V _{BE(sat)}	—	0.9	Vdc

SMALL–SIGNAL CHARACTERISTICS

Current –Gain–Bandwidth Product (V _{CE} = 20 Vdc, I _C = 10mA, f = 100 MHz)	f _T	50	—	MHz
Collector – Base Capacitance (V _{CB} = 20 Vdc, I _E = 0, f = 1.0 MHz)	C _{cb}	—	3.0	pF
		—	4.0	

3. Pulse Test: Pulse Width ≤300 μs, Duty Cycle ≤2.0%.

MMBTA42LT1 MMBTA43LT1

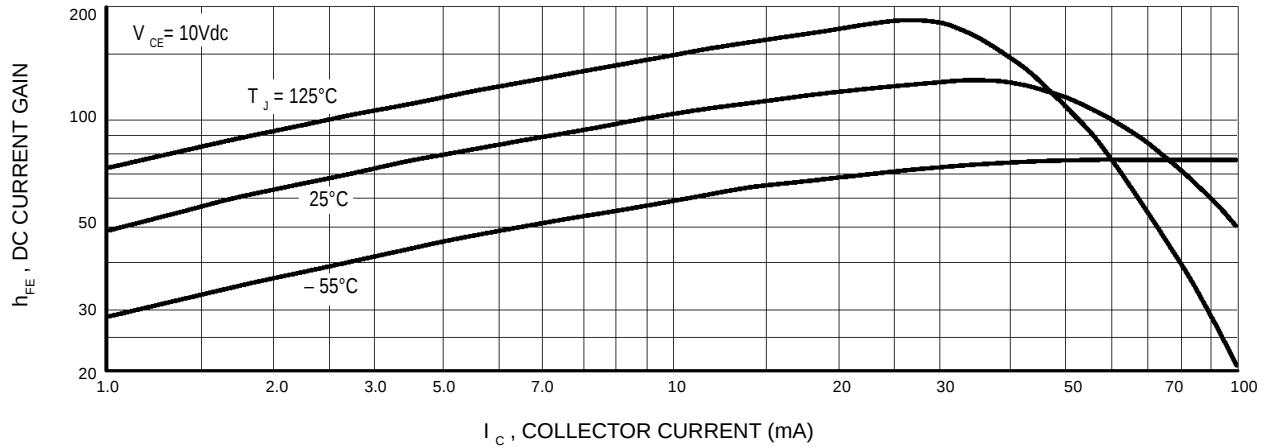


Figure 8. DC Current Gain

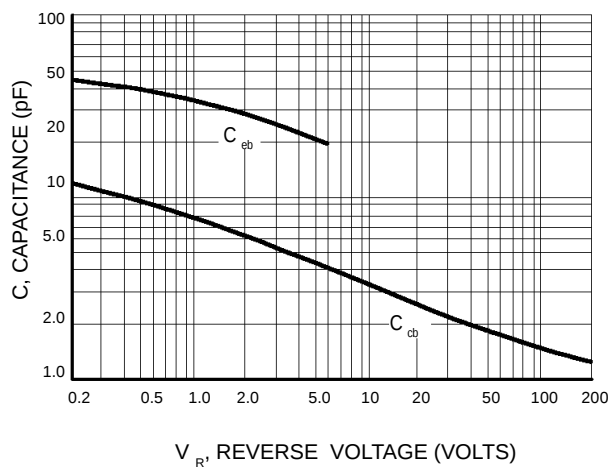


Figure 2. Capacitance

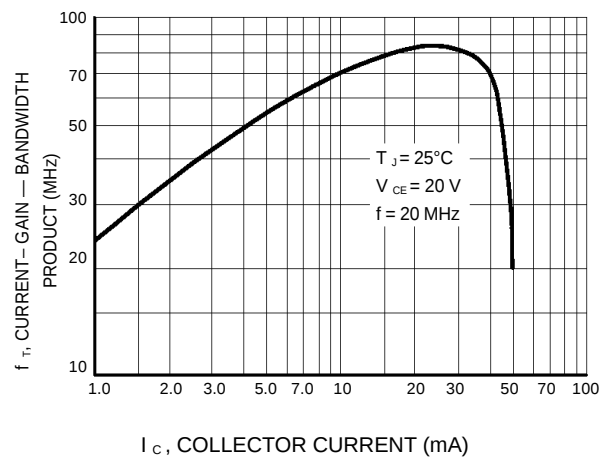


Figure 3. Current-Gain — Bandwidth Product

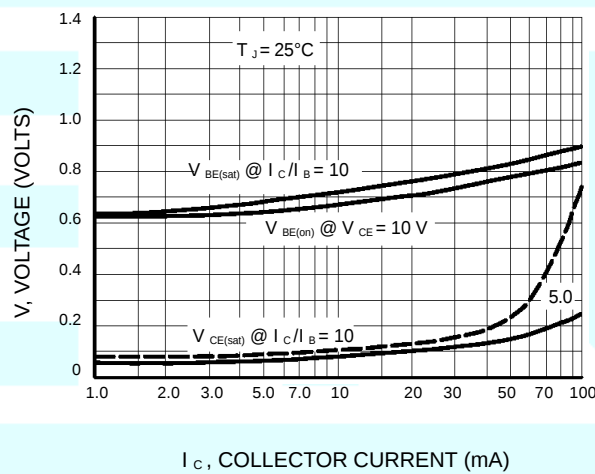


Figure 4. "On" Voltages